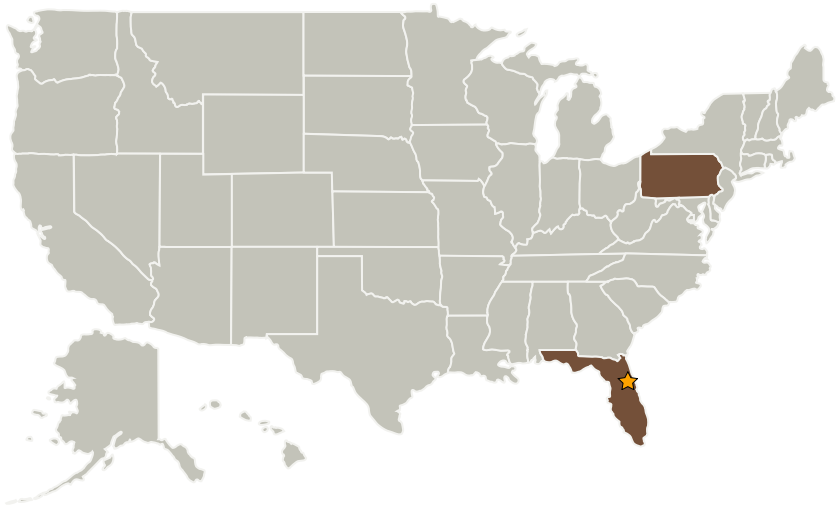
Passive Wireless Sensors for Spacecraft Applications, Phase I

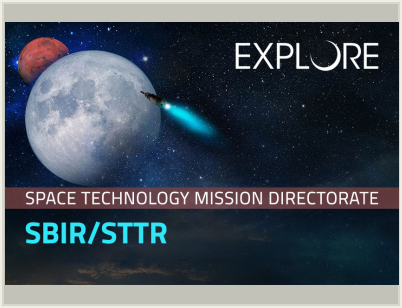
Completed Technology Project (2004 - 2005)

Project Introduction

New classes of sensors are needed on spacecraft that can be interrogated remotely using RF signals and respond with the sensor's identity as well as the environmental parameter without use of batteries. Such systems are emerging in the field of RF identification (RFID), but often lack the ability to encode a separate parameter and require the RFID tags to be mounted on an insulator-type surface. The proposed innovation does not employ the conventional 'backscatter' approach now being commercialized, which would preclude mounting the RF-powered sensor devices on metal surfaces. Passive and semiactive devices may respond on the same frequency as they are interrogated, or a separate frequency, and support frequency hopping. Advances are also needed to adapt the same to harsh air and space environments and to include encoding of sensor information for hundreds of sensors, with a total reporting time of about 1 second. Means must be incorporated to distinguish the multitude encoded responses from up to hundreds of sensors and the interrogator must not pose a health hazard to personnel.

Primary U.S. Work Locations and Key Partners





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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Kennedy Space Center (KSC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★Kennedy Space Center(KSC)	Lead Organization	NASA Center	Kennedy Space Center, Florida
Gnostic Communications	Supporting Organization	Industry	Pittsburgh, Pennsylvania

Primary U.S. Work Locations	
Florida	Pennsylvania

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

Marlin Mickle

Technology Areas

Primary:

- TX13 Ground, Test, and Surface Systems
  - TX13.2 Test and Qualification
    - TX13.2.7 Test Instruments and Sensors